<u>Amendments to the Claims</u>:

This listing of claims will replace all prior versions, and listings, of claims in the application:

1. (Previously presented) A method of determining the amount of phycocyanin-pigmented algae or bacteria in water from light reflected therefrom, said method comprising the steps of:

(a) obtaining a measurement of reflected light from said water, said measurement comprising a measurement of the respective amount of light in at least five ~~wavength~~ wavelength ranges: (i) from about 0.45 μm to about 0.52 μm (ii) from about 0.63 μm to about 0.69 μm; (iii) from about 0.76 μm to about 0.90 μm; (iv) from about 1.55 μm to about 1.75 μm and (v) from about 2.08 μm to about 2.35 μm; and

(b) determining the amount of said phycocyanin-pigmented algae or bacteria in said water from said respective amounts of light by applying an algorithm relating said respective amounts of light in said at least five wavelength ranges to said amount of said phycocyanin-pigmented algae or bacteria in said water.

2. (Previously presented) A method according to claim 1 wherein said measurement of the amount of light in said at least five ~~wavength~~ wavelength ranges comprises the measurement, respectively, of: (i) LANDSAT TM band 1, (ii) LANDSAT TM band 3, (iii) LANDSAT TM band 4, (iv) LANDSAT TM band 5 and (v) LANDSAT TM band 7.

3. (Previously presented) A method according to claim 2 wherein said algorithm is [any algorithm selected from the group consisting of]: $X \approx K_1 - K_2 \times (R31) + K_3 \times (R41) - K_4 \times (R43) - K_5 \times (R53) + K_6 \times (R73) - K_7 \times (R74)$ [and equivalents] wherein:

X is the determined amount of phycocyanin-pigmented algae or bacteria expressed in micrograms per liter;

K_1 is a value in the range of from about 30 to about 60;

K_2 is a value in the range of from about 5 to about 15;

K_3 is a value in the range of from about 20 to about 35;

K_4 is a value in the range of from about 100 to about 130;

K_5 is a value in the range of from about 3 to about 10;

K_6 is a value in the range of from about 30 to about 50;

K_7 is a value in the range of from about 5 to about 20;

R31 is the value of the reflectance in LANDSAT TM band 3 divided by the reflectance in LANDSAT TM band 1, after subtraction of the reflectance of atmospheric haze separately in each band;

R41 is the value of the reflectance in LANDSAT TM band 4 divided by the reflectance in LANDSAT TM band 1, after subtraction of the reflectance of atmospheric haze separately in each band;

R43 is the value of the reflectance in LANDSAT TM band 4 divided by the reflectance in LANDSAT TM band 3, after subtraction of the reflectance of atmospheric haze separately in each band;

R53 is the value of the reflectance in LANDSAT TM band 5 divided by the reflectance in LANDSAT TM band 3, after subtraction of the reflectance of atmospheric haze separately in each band;

R73 is the value of the reflectance in LANDSAT TM band 7 divided by the reflectance in LANDSAT TM band 3, after subtraction of the reflectance of atmospheric haze separately in each band; and

R74 is the value of the reflectance in LANDSAT TM band 7 divided by the reflectance in LANDSAT TM band 4, after subtraction of the reflectance of atmospheric haze separately in each band.

4. (Previously presented) A method according to claim 3 wherein:

X is the determined amount of phycocyanin-pigmented algae or bacteria expressed in micrograms per liter;

K_1 is a value in the range of from about 45 to about 50;

K_2 is a value in the range of from about 7 to about 11;

K_3 is a value in the range of from about 25 to about 35;

K_4 is a value in the range of from about 110 to about 120;

K_5 is a value in the range of from about 5 to about 8;

K_6 is a value in the range of from about 35 to about 45; and

K_7 is a value in the range of from about 10 to about 15.

5. (Previously presented) A method according to claim 3 wherein:

X is the determined amount of phycocyanin-pigmented algae or bacteria expressed · in micrograms per liter;

K_1 is a value in the range of from about 46 to about 48;

K_2 is a value in the range of from about 8 to about 10;

K_3 is a value in the range of from about 27 to about 30;

K_4 is a value in the range of from about 115 to about 120;

K_5 is a value in the range of from about 6 to about 8;

K_6 is a value in the range of from about 38 to about 43; and

K_7 is a value in the range of from about 13 to about 15.

6. (Previously presented) A method according to claim 1 wherein the determined amount of said phycocyanin-pigmented algae or bacteria correlates to the actual amount of said phycocyanin-pigmented algae or bacteria in said water by a correlation value in excess of 60%.

7. (Previously presented) A method according to claim 1 wherein the determined amount of said phycocyanin-pigmented algae or bacteria correlates to the actual

amount of said [phycocyanin] <u>said phycocyanin-pigmented algae or bacteria</u> in said water by a correlation value in excess of 70%.

8. (Previously presented) A method according to claim 5 wherein said determined amount of said phycocyanin-pigmented algae or bacteria correlates to the actual [measured] amount of said [phycocyanin] <u>said phycocyanin-pigmented algae or bacteria</u> in said water by a correlation value in excess of 60%.

9. (Previously presented) A method according to claim 5 wherein the said determined amount of said phycocyanin-pigmented algae or bacteria correlates to the actual [measured] amount of said [phycocyanin] <u>said phycocyanin-pigmented algae or bacteria</u> in said water by a correlation value in excess of 70%.

10. (Previously presented) A method according to claim 1 additionally comprising the step of transmitting data relating to [the approximate] <u>said determined</u> amount of said phycocyanin-pigmented algae or bacteria to a site remote from the site where said measurement takes place.

11. (Previously presented) A method according to claim 5 additionally comprising the step of transmitting data relating to [the approximate] <u>said determined</u> amount of said phycocyanin-pigmented algae or bacteria in said water to a site remote from the site where said measurement takes place.

12. (Previously presented) A method of determining the amount of phycocyanin-pigmented algae or bacteria in water from light reflected therefrom, said method comprising the steps of

    (a) obtaining a measurement of reflected light from said water, said measurement comprising a measurement of the respective amount of light in at least four wavelength ranges comprising, respectively: (i) LANDSAT TM band 1, (ii) LANDSAT TM band 3, (iii) LANDSAT TM band 5, and (iv) LANDSAT TM

band 7; and (b) determining the amount of said phycocyanin-pigmented algae or bacteria in said water from said respective amounts of light by applying an algorithm relating said respective amounts of light in said at least four wavelength ranges to said amount of [phycocyanin] <u>phycocyanin-pigmented algae or bacteria</u> in said water, wherein said algorithm is [any algorithm selected from the group consisting of]: $X \approx K_1 - K_2 \times (R31) + K_3 \times (R41) - K_4 \times (R43) - K_5 \times (R53) + K_6 \times (R73) - K_7 \times (R74)$ [and equivalents] wherein:

X is the determined amount of phycocyanin-pigmented algae or bacteria expressed in micrograms per liter;

K_1 is a value of about 48;

K_2 is a value of about 9;

K_3 is a value of about 30;

K_4 is a value of about 118;

K_5 is a value of about 7;

K_6 is a value of about 42;

K_7 is a value of about 15;

R31 is the value of the reflectance in LANDSAT TM band 3 divided by the reflectance in LANDSAT TM band 1, after subtraction of the reflectance of atmospheric haze separately in each band;

R41 is the value of the reflectance in LANDSAT TM band 4 divided by the reflectance in LANDSAT TM band 1, after subtraction of the reflectance of atmospheric haze separately in each band;

R43 is the value of the reflectance in LANDSAT TM band 4 divided by the reflectance in LANDSAT TM band 3, after subtraction of the reflectance of atmospheric haze separately in each band;

R53 is the value of the reflectance in LANDSAT TM band 5 divided by the reflectance in LANDSAT TM band 3, after subtraction of the reflectance of atmospheric haze separately in each band;

R73 is the value of the reflectance in LANDSAT TM band 7 divided by the reflectance in LANDSAT TM band 3, after subtraction of the reflectance of atmospheric haze separately in each band; and

R74 is the value of the reflectance in LANDSAT TM band 7 divided by the reflectance in LANDSAT TM band 4, after subtraction of the reflectance of atmospheric haze separately in each band.

13. (Previously presented) A method according to claim 12 additionally comprising the step of transmitting data relating to the determined amount of said phycocyanin-pigmented algae or bacteria in said water to a site remote from the site where said measurement takes place.

14. (Previously presented) A method according to claim 12 additionally comprising the step of generating a report of the determined amount of said phycocyanin-pigmented algae or bacteria in said water.

15. (Previously presented) A method according to claim 12 additionally comprising the step of transmitting data relating to the determined amount of said phycocyanin-pigmented algae or bacteria in said water to a site remote from the site where said measurement takes place.

16. (Previously presented) A method of determining the amount of phycocyanin-pigmented algae or bacteria in water from light reflected therefrom, said method comprising the steps of:

(a) obtaining a measurement of reflected light from said water at a location, said measurement comprising a measurement of the respective amount of light in at least five wavelength ranges: (i) from about 0.45 μm to about 0.52 μm; (ii) from about 0.63 μm to about 0.69 μm; (iii) from about 0.76 μm to about 0.90 μm; (iv)

from about 1.55 μm to about 1.75 μm; and (v) from about 2.08 μm to about 2.35 μm;

(b) transmitting data relating to said measurement to a site remote from [said] the measurement device; and

(c) determining the amount of said phycocyanin-pigmented algae or bacteria expressed in micrograms per liter in said water from said respective amounts of light at [said] the remote site by applying an algorithm to determine the amount of said phycocyanin-pigmented algae or bacteria in said water from said respective amounts of light in said at least five wavelength ranges.

17. (Previously presented) A method according to claim 16 additionally comprising the step of generating a report of said determined amount of said phycocyanin-pigmented algae or bacteria in said water.

18. (Withdrawn) An apparatus for determining the presence of phycocyanin algae or bacteria in water from light reflected therefrom, said device comprising:

(a) a measurement device adapted to measure reflected light from said water, said measurement comprising a measurement of the respective amount of light in at least five frequency ranges: (i) from about 0.45 μm to about 0.52 μm; (ii) from about 0.63 μm to about 0.69 μm; (iii) from about 0.76 μm to about 0.90 μm; (iv) from about 1.55 μm to about 1.75 μm; and (v) from about 2.08 μm to about 2.35 μm; and

(b) a processor capable of relating the approximate amount of said phycocyanin in said water to said respective amounts of light by applying an algorithm relating said respective amounts of light in said at least five frequency ranges to the amount of phycocyanin algae or bacteria in said water.

19. (Withdrawn) Apparatus according to claim 31 wherein said measurement of the

amount of light in said at least five frequency ranges comprises the measurement, respectively, of: (i) LANDSAT TM band 1, (ii) LANDSAT TM band 3, (iii) LANDSAT TM band 4 (iv) LANDSAT TM band 5, and (v) LANDSAT TM band 7.

20. (Withdrawn) An apparatus according to claim 34 wherein said algorithm is any algorithm selected from the group consisting of: $X \approx K_1 - K_2 \times (R31) + K_3 \times (R41) - K_4 \times (R43) - K_5 \times (R53) + K_6 \times (R73) - K_7 \times (R74)$ and equivalents wherein:

X is the approximate amount of phycocyanin algae or bacteria expressed in micrograms per liter;

K_1 is a value in the range of from about 30 to about 60;

K_2 is a value in the range of from about 5 to about 15;

K_3 is a value in the range of from about 20 to about 35;

K_4 is a value in the range of from about 100 to about 130;

K_5 is a value in the range of from about 3 to about 10;

K_6 is a value in the range of from about 30 to about 50;

K_7 is a value in the range of from about 5 to about 20;

R31 is the value of LANDSAT TM band 3 divided by LANDSAT TM band 1, after subtraction for atmospheric haze separately in each band;

R41 is the value of LANDSAT TM band 4 divided by LANDSAT TM band 1, after subtraction for atmospheric haze separately in each band;

R43 is the value of LANDSAT TM band 4 divided by LANDSAT TM band 3, after subtraction for atmospheric haze separately in each band;

R53 is the value of LANDSAT TM band 5 divided by LANDSAT TM band 3, after subtraction for atmospheric haze separately in each band;

R73 is the value of LANDSAT TM band 7 divided by LANDSAT TM band 3, after subtraction for atmospheric haze separately in each band; and

R74 is the value of LANDSAT TM band 7 divided by LANDSAT TM band 4, after subtraction for atmospheric haze separately in each band.

21. (Withdrawn) An apparatus according to claim 35 wherein:

X is the amount of phycocyanin algae or bacteria expressed in micrograms per liter;

K_1 is a value in the range of from about 45 to about 50;

K_2 is a value in the range of from about 7 to about 11;

K_3 is a value in the range of from about 25 to about 35;

K_4 is a value in the range of from about 110 to about 120;

K_5 is a value in the range of from about 5 to about 8;

K_6 is a value in the range of from about 35 to about 45; and

K_7 is a value in the range of from about 10 to about 15.

22. (Withdrawn) An apparatus according to claim 35 wherein:

X is the amount of phycocyanin algae or bacteria expressed in micrograms per liter;

K_1 is a value in the range of from about 46 to about 48;

K_2 is a value in the range of from about 8 to about 10;

K_3 is a value in the range of from about 27 to about 30;

K_4 is a value in the range of from about 115 to about 120;

K_5 is a value in the range of from about 6 to about 8;

K_6 is a value in the range of from about 38 to about 43; and

K_7 is a value in the range of from about 13 to about 15.

23. (Withdrawn) An apparatus according to claim 31 additionally comprising a report generator adapted to generate a report of said approximate amount of said phycocyanin in said water.

24. (Withdrawn) An apparatus according to claim 31 additionally comprising a transmitter adapted to transmit data relating to the approximate amount of said phycocyanin in said water from said processor to a site remote from the site where said measurement takes place.

25. (Withdrawn) An apparatus according to claim 31 wherein said measurement device is a camera.

26. (Withdrawn) An apparatus according to claim 31 wherein said processor is a microprocessor having programming instructions for applying said algorithm.

27. (Withdrawn) An apparatus according to claim 31 wherein said algorithm comprises a linear relationship between said approximate amount of said phycocyanin in said water and sum of (a) the ratio of said first frequency to said second frequency and (b) the ratio of said second frequency to said third frequency.

28. (Withdrawn) A buoy comprising an apparatus according to claim 31.

29. (Withdrawn) A buoy comprising an apparatus according to claim 35.

30. (Withdrawn) A hand-held device comprising an apparatus according to claim 31.

31. (Withdrawn) A hand-held device comprising an apparatus according to claim 35.

32. (Withdrawn) A hand-held device comprising an apparatus according to claim 37.

33. (Withdrawn) An apparatus for determining the presence of phycocyanin algae or bacteria in water from light reflected therefrom, said device comprising:

(a) a measurement device adapted to measure reflected light from said water, said measurement comprising a measurement of the respective amount of light in at least four frequencies comprising, respectively: (i) LANDSAT TM band 1, (ii) LANDSAT TM band 3, (iii) LANDSAT TM band 4, (iv) LANDSAT TM band 5, and (v) LANDSAT TM band 7; and

(b) a processor capable of relating the approximate amount of said phycocyanin in said water to said respective amounts of light by applying an algorithm relating said respective amounts of light in said at least five frequency ranges to the amount of phycocyanin algae or bacteria in said water,

wherein said algorithm is any algorithm selected from the group consisting of: $X \approx K_1 - K_2 \times (R31) + K_3 \times (R41) - K_4 \times (R43) - K_5 \times (R53) + K_6 \times (R73) - K_7 \times (R74)$ and equivalents wherein:

X is the approximate amount of phycocyanin algae or bacteria expressed in micrograms per liter;

K_1 is a value in the range of from about 30 to about 60;

K_2 is a value in the range of from about 5 to about 15;

K_3 is a value in the range of from about 20 to about 35;

K_4 is a value in the range of from about 100 to about 130;

K_5 is a value in the range of from about 3 to about 10;

K_6 is a value in the range of from about 30 to about 50;

K_7 is a value in the range of from about 5 to about 20;

R31 is the value of LANDSAT TM band 3 divided by LANDSAT TM band 1, after subtraction for atmospheric haze separately in each band;

R41 is the value of LANDSAT TM band 4 divided by LANDSAT TM band 1, after subtraction for atmospheric haze separately in each band;

R43 is the value of LANDSAT TM band 4 divided by LANDSAT TM band 3, after subtraction for atmospheric haze separately in each band;

R53 is the value of LANDSAT TM band 5 divided by LANDSAT TM band 3, after subtraction for atmospheric haze separately in each band;

R73 is the value of LANDSAT TM band 7 divided by LANDSAT TM band 3, after subtraction for atmospheric haze separately in each band; and

R74 is the value of LANDSAT TM band 7 divided by LANDSAT TM band 4, after subtraction for atmospheric haze separately in each band.

34. (Withdrawn) An apparatus according to claim 31 additionally comprising a report generator adapted to generate a report of said approximate amount of said phycocyanin in said water.

35. (Withdrawn) An apparatus according to claim 31 additionally comprising a transmitter adapted to transmit data relating to the approximate amount of said phycocyanin in said water from said processor to a site remote from the site where said measurement takes place.

36. (Withdrawn) A system for determining the presence of phycocyanin algae or bacteria in water from light reflected therefrom, said device comprising:

(a) a measurement device adapted to measure reflected light from said water, said measurement comprising a measurement of the respective amount of light in at least five frequency ranges: (i) from about 0.45 μm to about 0.52 μm; (ii) from about 0.63 μm to about 0.69 μm; (iii) from about 0.76 μm to about 0.90 μm; (iv) from about 1.55 μm to about 1.75 μm; and (v) from about 2.08 μm to about 2.35 μm; and

(b) a processor at said remote site and capable of relating the approximate amount of said phycocyanin in said water to said respective amounts of light by applying an algorithm relating said respective amounts of light in said at least five frequency ranges to the amount of phycocyanin algae or bacteria in said water.

37. (Withdrawn) A method of developing an apparatus for determining the presence of phycocyanin algae or bacteria in water from light reflected therefrom, said device comprising:

(a) obtaining a measurement of reflected light from said water, said measurement comprising a measurement of the respective amount of light of at least two frequencies;

(b) developing an algorithm relating said respective amounts of light in said at least two frequencies to the amount of phycocyanin algae or bacteria in said water through linear regression analysis;

(c) producing a processor capable of relating the approximate amount of said phycocyanin in said water to said respective amounts of light by applying an algorithm relating said respective amounts of light in said at least five frequency ranges to the amount of phycocyanin algae or bacteria in said water;

(d) providing a measurement device adapted to measure reflected light from said water and adapted to provide data relating to said measurement to said processor.

38. (Cancelled) A method of determining the amount of phycocyanin-pigmented algae or bacteria in water from light reflected therefrom, said method comprising the steps of:

(a) obtaining a measurement of reflected light from said water, said measurement comprising a measurement of the respective amount of light in at least two of the following wavelength ranges: (i) from about 0.45 µm to about 0.52 µm (ii) from about 0.63 µm to about 0.69 µm; (iii) from about 0.76 µm to about 0.90 µm; (iv) from about 1.55 µm to about 1.75 µm and (v) from about 2.08 µm to about 2.35 µm; and

(b) determining the amount of said phycocyanin-pigmented algae or bacteria in said water from said respective amounts of light by applying an algorithm relating said

respective amounts of light in said least two of said wavelength ranges to said amount of said phycocyanin-pigmented algae or bacteria in said water, and wherein said algorithm comprises a quantitative relationship between the ratio of the amount of light in a first of said wavelength ranges to the amount of light in a second of said wavelength ranges, and the amount of said phycocyanin-pigmented algae or bacteria in said water.

39. (Cancelled) A method according to claim 38 wherein said algorithm comprises a quantitative relationship between the ratio of the amount of light in a first of said wavelength ranges to the amount of light in a second of said wavelength ranges, and the amount of said phycocyanin-pigmented algae or bacteria in said water.

40. (Cancelled) A method of determining the amount of phycocyanin-pigmented algae or bacteria in water from light reflected therefrom, said method comprising the steps of:

(a) obtaining a measurement of reflected light from said water, said measurement comprising a measurement of the respective amount of light at three wavelengths; and

(b) determining the amount of said phycocyanin-pigmented algae or bacteria in said water from said respective amounts of light by applying an algorithm relating said respective amounts of light in said three wavelengths to said amount of said phycocyanin-pigmented algae or bacteria in said water, wherein said algorithm comprises a quantitative relationship between the sum of (1) the ratio of the amount of light at the first of said wavelengths to the amount of light at the second of said wavelengths and (2) the ratio of the amount of light at the second of said wavelengths to the amount of light at the third of said wavelengths; and the amount of said phycocyanin-pigmented algae or bacteria in said water.

41. (Cancelled) A method according to claim 40 wherein said algorithm comprises a quantitative relationship between the sum of (1) the ratio of the amount of light at the first of said wavelengths to the amount of light at the second of said wavelengths and (2) the ratio of the amount of light at the second of said wavelengths to the amount of light at the third of said wavelengths; and the amount of said phycocyanin-pigmented algae or bacteria in said water.

42. (Cancelled) A method of determining the amount of phycocyanin-pigmented algae or bacteria in water from light reflected therefrom, said method comprising the steps of:

(a) obtaining a measurement of reflected light from said water, said measurement comprising a measurement of the respective amount of light in at least two wavelengths within respective two of the following five wavelength ranges: (i) from about 0.45 µm to about 0.52 µm (ii) from about 0.63 µm to about 0.69 µm; (iii) from about 0.76 µm to about 0.90 µm; (iv) from about 1.55 µm to about 1.75 µm and (v) from about 2.08 µm to about 2.35 µm; and

(b) determining the amount of said phycocyanin-pigmented algae or bacteria in said water from said respective amounts of light by applying an algorithm relating said respective amounts of light in said at least two wavelengths to said amount of said phycocyanin-pigmented algae or bacteria in said water, wherein said algorithm comprises a quantitative relationship between the sum of the ratio of the amount of light at the first of said wavelengths to the amount of light at the second of said wavelengths.

43. (Cancelled) A method according to claim 42 wherein said algorithm comprising a measurement of the respective amount of light in: (i) LANDSAT TM band 1; (ii) LANDSAT TM band 3, (iii) LANDSAT TM band 4, and (iv) LANDSAT TM band 5, and wherein said algorithm comprises a quantitative relationship between the sum of the following ratios:

(a) the reflectance in LANDSAT TM band 3 divided by the reflectance in LANDSAT TM band 1, after subtraction of the reflectance of atmospheric haze separately in each band;

(a) the reflectance in LANDSAT TM band 4 divided by the reflectance in LANDSAT TM band 1, after subtraction of the reflectance of atmospheric haze separately in each band;

(a) the reflectance in LANDSAT TM band 4 divided by the reflectance in LANDSAT TM band 3, after subtraction of the reflectance of atmospheric haze separately in each band; and

(a) the reflectance in LANDSAT TM band 5 divided by the reflectance in LANDSAT TM band 3, after subtraction of the reflectance of atmospheric haze separately in each band.